

September 9, 2005

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 Twelfth Street, SW  
Washington, DC 20554

Re: *Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit  
Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands - IB Docket No. 02-364*  
WRITTEN EX PARTE COMMUNICATION

Dear Ms. Dortch:

One year ago, the Wireless Communications Association International, Inc. ("WCA") petitioned the Commission to reconsider certain aspects of its decision in the *Report and Order* in IB Docket No. 02-364 to reallocate the 2496-2500 MHz band to the Broadband Radio Service ("BRS"). Among other concerns expressed by WCA was the Commission's failure to properly assess and mitigate the potential for interference to BRS licensees from Part 18 Industrial, Scientific and Medical ("ISM") operations that remain in the band.<sup>1</sup> WCA's petition advanced a good-faith proposal to address the issue, but that proposal has met with opposition from some ISM interests. In the hope of expediting a resolution to this matter (which must be settled before the Commission can auction the 1710-1755/2110-2155 MHz bands for the Advanced Wireless Service ("AWS")), WCA is today offering a new proposal to govern sharing of the band by ISM and BRS. As will be detailed below, WCA's revised proposal has been crafted, to the extent possible given the failure of the ISM industry to submit meaningful technical information regarding its emissions in the 2496-2500 MHz band, to address the concerns expressed regarding WCA's prior approach.

The problem, as WCA has stated, is that under Section 18.305(a) of the Commission's Rules, there is *no limit whatsoever* on the power levels at which ISM devices can operate within the 2496-2500 MHz band that ISM must now share with BRS. It is, for example, a matter of record that BRS base station receivers will suffer interference if subjected to a cochannel signal

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<sup>1</sup> Petition for Partial Reconsideration of Wireless Communications Ass'n Int'l, Inc., IB Docket No. 02-364, at 23-26 (filed Sept. 8, 2004) ["WCA Petition"].

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level exceeding -107 dBm measured over 5.5 MHz,<sup>2</sup> and one need not perform exceptionally sophisticated engineering to appreciate that if the power of cochannel ISM devices is not regulated, BRS facilities at 2496-2500 MHz are vulnerable to harmful interference. Thus, while several of the opponents of WCA's proposal suggest that their particular product will not cause interference to BRS, those filers miss the point – regardless of whether any particular ISM device will cause interference to BRS, there can be no denying that BRS faces a serious potential for harmful interference in the new band.<sup>3</sup>

To alleviate this patently unacceptable situation, WCA had urged the Commission to impose restrictions on Part 18 operations in the 2496-2500 MHz band that will allow reasonable co-existence among ISM and BRS users.<sup>4</sup> Specifically, WCA suggested in its petition that the Commission require all Part 18 ISM devices marketed in the United States after December 31, 2006 to restrict their emissions in the 2496-2500 MHz band to 500 microvolts/meter, measured at 3 meters.<sup>5</sup> This is the emission limit applicable to unlicensed intentional radiators under Section 15.209(a) of the Commission Rules. The 2496-2502 MHz band is slated to be used for

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<sup>2</sup> See, e.g., 47 C.F.R. § 27.1221; *Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 14165, 14211 (2004); Wireless Communications Ass'n Int'l, Inc., Nat'l ITFS Ass'n and Catholic Television Network, Second Supplement to "A Proposal For Revising The MDS And ITFS Regulatory Regime", RM-10586, at 6 (filed Feb. 7, 2003); Comments of Wireless Communications Ass'n Int'l, Inc. *et al.*, WT Docket No. 03-66, at 53 (filed Sept. 8, 2003).

<sup>3</sup> The *Report and Order* suggested that BRS and ISM could co-exist because current users of the 2496-2500 MHz band appear able to coexist with ISM. See *Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands and Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Service to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems*, IB Docket No. 02-364 and ET Docket No. 00-258, Report and Order, Fourth Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 13356, 13386 (2004). However, as WCA noted in its petition: (i) the types of two-way broadband uses that BRS licensees will make of the band are materially different from current uses; and (ii) to the extent that the spectral mask requirements applicable above 2500 MHz effectively limit power levels in the spectrum immediately below 2500 MHz, future improvements in filter technology may allow higher power use of the 2496-2500 MHz band while still meeting the out-of-band requirements imposed above 2500 MHz. See WCA Petition at 24-25.

<sup>4</sup> See, e.g., WCA Petition at 23 ("[h]aving high-power ISM equipment share spectrum with the ubiquitous portable and mobile services envisioned by the Commission would appear to be a recipe for disaster."); Letter from Paul J. Sinderbrand, Counsel to WCA, to Marlene H. Dortch, Secretary, FCC, IB Docket No. 02-364, at 2 (filed Aug. 5, 2005) ["WCA August 5<sup>th</sup> *Ex Parte* Letter"]; Letter from Paul J. Sinderbrand, Counsel to WCA, to Marlene H. Dortch, Secretary, FCC, IB Docket No. 02-364, at 2 (filed July 26, 2005); Letter from Paul J. Sinderbrand, Counsel to WCA, to Marlene H. Dortch, Secretary, FCC, IB Docket No. 02-364 (filed July 11, 2005) ["WCA July 11<sup>th</sup> *Ex Parte* Letter"]; Joint Reply of Wireless Communications Ass'n Int'l, Inc. *et al.*, IB Docket No. 02-364 (filed Mar. 11, 2005) ["WCA Joint Reply"]; Surreply of Wireless Communications Ass'n Int'l, Inc., IB Docket No. 02-364 (filed Dec. 17, 2004) ["WCA Surreply"].

<sup>5</sup> See WCA Petition at 25.

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BRS channel 1 licensees being involuntarily relocated from the 2150-2156 MHz band to clear the way for AWS, and WCA's proposed limit is the maximum unlicensed emission level to which BRS licensees have been subjected in the 2150-2156 MHz band.<sup>6</sup> Thus, application of this limit to the 2496-2500 MHz band would be consistent with the Commission's overriding policy of keeping whole those licensees forced to relocate as a result of spectrum refarming.

No timely oppositions to WCA's proposal were filed. However, subsequent to the filing deadline a handful of ISM interests came forward to oppose WCA's proposal. As WCA has noted, these filings evidence several attributes – they do not seriously dispute the threat to BRS from the lack of any ISM power limit,<sup>7</sup> they advance arguments that are patently absurd,<sup>8</sup> and while they employ shrill rhetoric to attack WCA's proposal as unworkable, they neither make any attempt to quantify the costs associated with complying with WCA's proposal nor identify any meaningful alternative solution to the problems BRS channel 1 licensees face by virtue of the Commission's decision to relocate them to an encumbered band.<sup>9</sup>

Nonetheless, WCA has consistently expressed a willingness to re-evaluate its position and accept a maximum ISM power level for the 2496-2500 MHz band segment that differs from the Part 15 levels.<sup>10</sup> While WCA had hoped that the ISM community would cooperate with

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<sup>6</sup> See 47 C.F.R. § 15.209(a).

<sup>7</sup> The typical response has been to harp on WCA's "failure" to demonstrate that the filer's particular ISM device will cause interference to BRS channel 1 operations once they are relocated. But, as noted above, that ignores the point. While a particular device that is currently in the market may or may not cause interference to relocated BRS operations, no one can seriously dispute that the lack of any limit whatsoever on emissions within the 2496-2500 MHz band poses a danger to relocated BRS operations. While WCA has little doubt that if BRS facilities were relocated to the 2496-2500 MHz band, they would suffer harmful interference from ISM devices, it has been placed in the untenable position of trying to prove its case without the ISM community providing any meaningful information whatsoever about its emissions in the 2496-2500 MHz band.

<sup>8</sup> For example, one cannot square the argument by Whirlpool Corp. and the Association of Home Appliance Manufacturers ("AHAM") that it is impossible to measure in-band emissions with AHAM's own admission that the Food and Drug Administration ("FDA") imposes in-band emission limits on microwave ovens. Compare Replies of the Ass'n of Home Appliance Manufacturers, WT Docket No. 02-364, at 7 (filed Nov. 8, 2004) ["AHAM Opposition"] ("[t]he only in-band limits of which AHAM is aware is that imposed by the Food and Drug Administration.") with *id.* ("unlike Part 15 devices, radiated emissions for ISM devices are generally not even measured inside the band, but are only measured outside the ISM band."). As WCA noted in response, "[u]nless the Microwave Oven Vendors are operating in complete disregard of the FDA's requirements, some mechanism must exist for measuring in-band emissions of microwave ovens, and one would assume that such a mechanism would be available to verify compliance with the 500 uV/m at 3 meters power limit proposed by the BRS Parties." WCA Surreply at 9 (emphasis in original).

<sup>9</sup> The flaws in the ISM responses to WCA are recounted in the pleadings cited *supra* in footnote 4 and need not be repeated here.

<sup>10</sup> See WCA Joint Reply at 9-10 ("[w]hile the BRS Parties would be open to any alternative solution that reduces the impact on ISM of protecting relocated BRS channel 1 operations, the BRS Parties are hamstrung by the total

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WCA's effort to identify a "win-win" solution, it is clear that those opposing WCA's initial proposal have no interest at the present time in solving the problem.<sup>11</sup> Thus, WCA has no choice but to advance its latest proposal unilaterally.

WCA now proposes that the Commission reduce the risk to relocated BRS channel 1 operations by restricting Part 18 ISM operations in the 2496-2500 MHz band to the maximum field strength levels currently set forth in Section 18.305 of the Commission's Rules for emissions about 2500 MHz. As in its original proposal, WCA's current recommendation does not seek to impose the power limit on any existing microwave emitters. Indeed, to afford ISM vendors sufficient time to make any necessary modifications and to market existing inventory, WCA proposes that the rule change become effective only following a transition period similar to that employed when the Commission first subjected ISM devices to conducted limits.<sup>12</sup> In other words, while the Part 18 limits currently apply below 2400 MHz and above 2500 MHz, under WCA's proposal they would apply below 2400 MHz and above 2496 MHz after a transition period during which ISM interests could sell existing inventory and modify existing designs to meet the new rules. As a result, Section 18.305(a) would be revised to read as follows:

(a) ISM equipment operating on a frequency specified in § 18.301 is permitted unlimited radiated energy in the band specified for that frequency. Notwithstanding the previous sentence, emissions within 2496-2500 MHz from ISM equipment that either is authorized under the certification, verification or declaration of conformity procedures on or after [insert date two years from adoption of new rules] or is manufactured or imported on or after [insert date

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unwillingness of the ISM community to acknowledge the problem, much less engage in a meaningful discussion of possible solutions."); WCA July 11<sup>th</sup> *Ex Parte* Letter at 3 ("[t]he BRS Parties remain open to any alternative solution that addresses the BRS/ISM interference problem in an equitable manner. No such solution is achievable, however, so long as the ISM community refuses to come to the table or even acknowledge that the problem exists."); WCA August 5<sup>th</sup> *Ex Parte* Letter at 2 ("the refusal of the ISM community to cooperate with efforts to craft rules to govern sharing is significantly hindering efforts to identify mutually beneficial solutions.").

<sup>11</sup> Indeed, one of the opponents to WCA's approach refused WCA's invitation to participate in a meeting designed to explore possible technical solution.

<sup>12</sup> There is ample precedent for requiring compliance within the timeframe WCA suggests. In 2002, the Commission amended its rules to require microwave ovens to comply with new conducted emission limits, even though they had not been subject to *any* conducted emission limits before. See *Biennial Regulatory Review – Conducted Emissions Limits Below 30 MHz for Equipment Regulated under Parts 15 and 18 of the Commission's Rules*, Report and Order, 17 FCC Rcd 10806, 10813-10814 (2002). To provide the microwave oven industry with sufficient time to comply with the new limits, the Commission grandfathered (i) all microwave ovens authorized under the Commission's equipment authorization procedures within two years after the effective date of its decision, and (ii) all microwave ovens manufactured or imported within three years of the effective date of its decision. *Id.* at 10816; see also 47 C.F.R. § 18.123.

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three years from adoption of new rules] shall not exceed the levels set forth in subsection 18.305(b).

To date, the most vocal opponents of WCA's initial approach have been the vendors of microwave ovens. Although their arguments have mischaracterized WCA's position and evidenced a cavalier preference for selling the cheapest possible consumer ovens over those which are spectrally efficient,<sup>13</sup> WCA's revised position has been designed to eliminate any legitimate concern from the microwave oven vendors. WCA is confident that it has accomplished that objective, because tests conducted by the National Telecommunications and Information Administration ("NTIA") establish that those microwave ovens that actually meet the current Part 18 requirements applicable above 2500 MHz also meet that same benchmarks between 2496-2500 MHz.<sup>14</sup> Moreover, to the extent that any microwaves being marketed today do not meet the limits proposed by WCA, NTIA has found that the key to compliance is the "judicious selection of the better magnetron tubes already available" and that "an improvement could be made without increased cost or magnetron tube development."<sup>15</sup> In other words, it

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<sup>13</sup> An example of their mischaracterization of WCA's position can be found in their erroneous suggestion that under WCA's proposal existing microwaves would have to be recalled and modified. *See, e.g.*, AHAM Opposition at 3 ("[a]ny changes to the current regulatory framework governing ISM devices, such as the approximately 95 million microwave ovens currently in use in the United States, would impose tremendous costs on manufacturers and ultimately consumers."); *id.* at 5 (suggesting that the BRS Parties are proposing to "requir[e] existing users to modify their operations to protect an as yet-undeveloped service."); Replies of General Electric Consumer and Industrial, IB Docket No. 02-364 *et al.*, at 2 (filed Nov. 9, 2004). This scare tactic fundamentally distorts WCA's filings. To the contrary, WCA specifically proposed to permit continued operation of all microwave ovens already in the field plus any others that are marketed by December 31, 2006. *See* WCA Petition at 23-26.

<sup>14</sup> *See* Gawthrop, *et al.*, Radio Spectrum Measurements of Individual Microwave Ovens, NTIA Report 94-303-1, U.S. Department of Commerce (March 1994) ["NTIA Microwave Oven Report"]. The results of the NTIA analysis, set against the Part 18 standard, are set forth in tabular form on Attachment A. As that table shows, microwave ovens 1, 2, 5, 8, 9, 10 and 12 all complied with Part 18. Of those, ovens 1, 2, 5, 8 and 10 met the benchmark that WCA is proposing here.

Of course, WCA is greatly troubled by the fact that NTIA has identified significant flaws in the procedures used by the Commission for testing microwave oven compliance with Part 18. *Id.* at 6-10. Indeed, the NTIA Microwave Oven Report specifically recommended that "[i]n light of the evolving radiocommunications environment, the FCC needs to review its method of measurement and consequently the related limit value applying to microwave ovens and revise Part 18 as necessary." *Id.* at 13. Yet, in the subsequent decade, it appears that nothing has been done to better assure that microwave ovens provide reasonable interference protection to neighboring communications services. This is not a benign issue – NTIA discovered numerous devices that do not appear to comply with the existing Part 18 requirements relative to emissions above 2500 MHz when tested under procedures that reasonably recreate real world conditions. As is evidenced by the table annexed as Attachment A, nearly one-half the microwave ovens tested by NTIA were presumably certified as compliant with Part 18, but failed to meet Part 18 limits when tested by NTIA utilizing more appropriate test procedures. Although beyond the scope of this proceeding, it is imperative that the Commission carefully re-examine the procedures it uses to test compliance with Part 18 by microwave oven vendors and make the necessary changes to assure that licenses in neighboring bands are not unfairly prejudiced.

<sup>15</sup> *Id.* at 95.

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appears that most microwave oven vendors that comply with Part 18 today will be able to continue selling existing designs without modification after adoption of WCA's proposal, and that any that do not meet WCA's proposal can easily come into compliance. This blunts the recent assertion by AHAM that "the nature of emissions from microwave ovens will not permit limitation of the use of part of the ISM band (*i.e.*, the segment from 2496-2500 MHz) without the re-design of those devices."<sup>16</sup>

Unfortunately, WCA is unable to identify at this juncture the impact, if any, that its proposal will have on other ISM equipment – as noted above, ISM interests have stubbornly refused to provide any technical information regarding their emissions at 2496-2500 MHz (in one case even refusing to meet with WCA), and WCA has been unable to identify any publicly available information. Suffice it to say that WCA believes its new proposal is a reasonable compromise that is likely to accommodate the overwhelming majority of ISM devices with little, if any, changes required. WCA hopes that in response to this proposal, the ISM community will now drop its shrill rhetoric and engage in a meaningful dialog to resolve the problem. The Commission has mandated that ISM and BRS share the 2496-2500 MHz band, and that will require compromise on both sides. WCA is today proposing a solution that will subject relocated BRS channel 1 licensees to substantially more interference from unlicensed sources than they currently receive. It is now time for the ISM community to accept that sharing requires compromise on both sides, and commence a dialog.<sup>17</sup>

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<sup>16</sup> Letter from Russell Fox, counsel to AHAM, to Marlene H. Dortch, Secretary, FCC, IB Docket No. 02-364, at 1 (filed July 22, 2005). Sadly, AHAM continues to argue that consumers should be forced to physically separate their BRS devices from microwave ovens to avoid interference. *See id.* at 2 n.1. While sufficient physical separation might mitigate interference, the separation necessary to achieve sufficient isolation between the devices will vary wildly depending on the attenuation of the specific environment and could require separation distances that are unrealistic, particularly in a residential setting. The suggestion that a consumer should have to choose between using his or her microwave and utilizing his or her laptop computer or other BRS-enabled device in the kitchen is absurd. Since the NTIA report establishes that microwave oven vendors can and do comply with WCA's proposed suggestion, the public interest in efficient use of the spectrum (as opposed to the financial interest of AHAM members in selling \$29.99 microwave ovens) dictates that ISM devices be subject to a reasonable limit on emissions within the 2496-2500 MHz band.

<sup>17</sup> For example, Fusion UV Systems, Inc. ("Fusion") has contended that its devices are housed or shielded in a manner which minimizes any possibility of harmful interference to surrounding licensed facilities. *See Consolidated Opposition of Fusion UV Systems, Inc. to Petitions for Reconsideration*, IB Docket No. 02-364 *et al.*, at 11-12 (filed Jan. 21, 2005). Although WCA's filings invited Fusion to supplement the record on this point, and WCA even sought to meet with representatives of Fusion to explore the crafting of a rule that would accommodate Fusion, Fusion has refused to cooperate. Certainly, if Fusion or others install their equipment in a manner that they are shielded and thus will not produce interference, there must be a way to capture that concept in a rule. WCA remains open to such a possibility, but cannot do so unilaterally because WCA just does not have sufficient knowledge regarding the installation process for Fusion's products.

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Should you have any questions regarding this matter, please contact the undersigned.

Respectfully submitted,

*/s/ Paul J. Sinderbrand*

Paul J. Sinderbrand

Counsel for the Wireless Communications  
Association International, Inc.

Attachment

cc: Fred Campbell  
John Branscome  
John Giusti  
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Geraldine Matise  
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ATTACHMENT A

Summary of Emissions Found By NTIA Compared to Part 18 Limits

NTIA Oven #	Measured Power (Watts)	Magnetron Type	Meets FCC Part 18 OOB (> 2500 MHz) Y/N?	Worst Case Margin (dB)	Meets WCA Proposal Y/N?	Worst Case Margin (dB)
MWO1	644	Type - A	Y	24.2	Y	12.4
MWO2	771	Type - D	Y	5.0	Y	4.0
MWO4	520	Type - E	N	-7.3	N	-12.5
MWO5	718	Type - A	Y	19.1	Y	8.0
MWO6	698	Type - H	N	-0.1	N	-8.7
MWO7DUP	698	Type - G	N	-5.6	Y	2.8
MWO7	668	Type - G	N	-15.2	N	-21.1
MWO8	804	Type - B	Y	17.7	Y	18.4
MWO9	762	Type - C	Y	9.2	N	-7.5
MWO10	659	Type - A	Y	17.3	Y	6.2
MWO11	714	Type - F	N	-6.5	N	-11.5
MWO12	698	Type - D	Y	8.2	N	-2.5
MWO13	682	Type - G	N	-8.4	N	-6.5